

Claims

What is claimed is:

1. A granular fertilizer of relatively low analysis organic waste material having an enhanced plant nutrient value composition, said fertilizer produced by the process comprising:

mixing said relatively low analysis organic waste material with water to form a slurry capable of being pumped;

pumping said slurry to a pipe-cross reactor for reaction with a base, acid, and water to form a melt;

spraying said melt onto a recycling bed of fines in a granulator, and flashing off water contained in the melt as steam;

rolling said melt onto fine particles in the granulator to form said granular fertilizer; and

drying said granular fertilizer to reduce the moisture content thereof to form dried granular fertilizer comprising an enhanced plant nutrient value composition.

2. The granular fertilizer of claim 1, wherein said granular fertilizer is substantially homogenous.

3. The granular fertilizer of claim 1, wherein said granular fertilizer is sized and shaped for application by standard granular fertilizer application equipment.

4. The granular fertilizer of claim 1, wherein said granular fertilizer has substantially the same size, shape, and density as a conventional granular fertilizer.

5. A granular fertilizer of relatively low analysis organic waste material having an enhanced plant nutrient value composition, said fertilizer produced by the process comprising:

mixing said relatively low analysis organic waste material with water to form a slurry capable of being pumped;

pumping said slurry to a pipe-cross reactor for reaction with a base, acid, and water to form a melt;

spraying said melt onto a recycling bed of fines in a granulator, and flashing off water contained in the melt as steam;

rolling said melt onto fine particles in the granulator to form said granular fertilizer;

drying said granular fertilizer to reduce the moisture content thereof to form dried granular fertilizer comprising an enhanced plant nutrient value composition; and

collecting fumes from the granulator containing steam, ammonia and particulate by maintaining a negative pressure inside the granulator by pulling the fumes through a venturi scrubber having a venturi throat with low pH water as scrubber water sprayed into the venturi throat.

6. The granular fertilizer of claim 5, wherein the pH of the scrubber water is kept low by incorporating spent acid from a hot dip galvanizing process into the scrubber water.

7. The granular fertilizer of claim 6, wherein said spent acid from said hot dip galvanizing process contains about three percent to about eight percent zinc.

8. The granular fertilizer of claim 7, wherein said spent acid from said hot dip galvanizing process contains about three percent to about eight percent iron.

9. The granular fertilizer of claim 6, wherein the pH of the scrubber water is kept low by incorporating spent acid from a steel pickling process into the scrubber water.

10. The granular fertilizer of claim 9, wherein said spent acid from said steel pickling process contains about three percent to about eight percent iron.

11. The granular fertilizer of claim 5, wherein said granular fertilizer is substantially homogenous.

12. The granular fertilizer of claim 5, wherein said granular fertilizer is sized and shaped for application by standard granular fertilizer application equipment.

13. The granular fertilizer of claim 5, wherein said granular fertilizer has substantially the same size, shape, and density as a conventional granular fertilizer.

14. An improvement in a process of treating relatively low analysis organic waste material, said process involving the treatment of the relatively low analysis organic waste material with exothermically reacting acid and base to enhance the relatively low analysis organic waste material's plant nutrient value, the improvement comprising conducting said treatment in a pipe-cross reactor.

15. The improvement of claim 14, wherein the pipe-cross reactor feeds into a granulator.

16. The improvement of claim 14, wherein the relatively low analysis organic waste material is selected from the group consisting of sewage sludge, poultry manure, food processing wastes, wastes from paper manufacturing, swine manure sludge, and mixtures thereof.